

THE DENTAL PRACTITIONER AND DENTAL RECORD

Including the official reports of the British Society of Periodontology, the British Society for the Study of Orthodontics, the European Orthodontic Society, the Liverpool and District Odontological Society, the North Staffordshire Society of Dental Surgeons, the Odonto-chirurgical Society of Scotland, and the Dental and Medical Society for the Study of Hypnosis

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January, 1957

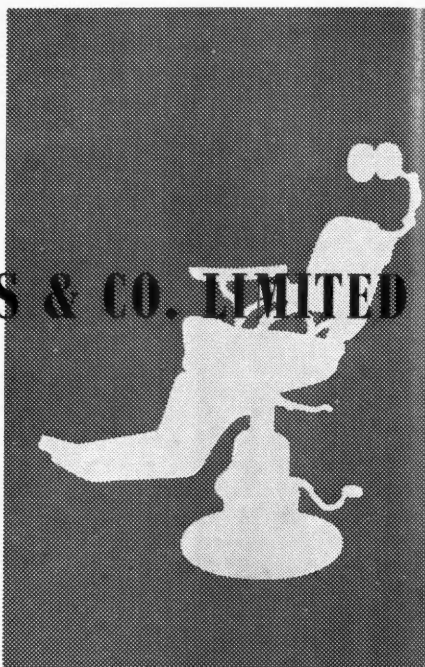
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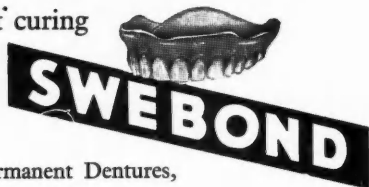
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References to dental literature should be recorded in the text, with the name of the author and the year of publication in parentheses. In the bibliography they should be arranged in alphabetical order in the following form, the abbreviations of periodicals being those adopted in the *World List of Scientific Periodicals* (1952), e.g.:—

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THE DENTAL PRACTITIONER AND DENTAL RECORD

Vol. VII, No. 5

January, 1957

EDITORIAL



MATTERS OF POLICY

WITH the passing of one year and the incoming of another it is perhaps fitting that we should pause for a moment to consider what progress we have made in the twelve months that have gone by, and the advances that will be possible in the immediate future. The outstanding event was clearly the formation of an Editorial Board composed of leaders of the dental profession and representatives of the various dental schools and centres. This gave an added standing to the journal and resulted in our being offered a greatly increased number of original contributions, many of outstanding merit.

In addition we have received a great deal of material from the various specialist societies, so that we are now in the happy position of having an "embarrassment of riches"—a state of affairs which we hope will long continue.

As always, however, there is "another side to the problem". In our case it is how best to accommodate the wealth of material and how to combat the rising costs which during the past year have been unusually heavy.

With regard to the material, even greater effort will be made to ensure that each number maintains a balance between the specialist articles and those of interest to the

general dental practitioner, and as far as possible articles of practical interest will be given precedence. Furthermore, it is proposed to confine future issues to papers, book reviews, correspondence, and abstracts from the current literature and to omit national health service notes, society notes, parliamentary news, etc., on the grounds that these are published fully elsewhere. By this means room will be made for additional articles.

As to rising costs, great efforts are being made to effect legitimate savings, but even so it is inevitable that the subscription rate will have to be increased. During the last year printing costs have risen sharply, blockmaker's charges have advanced by 20-30 per cent, and postal rates have been increased. Therefore the subscription rate will be increased as from March 1 to two guineas, the increase operating from the expiry date of the existing yearly subscription. Advertisers, too, will be asked to pay a little more.

It is hoped that these measures, unpalatable as they are to publishers and subscribers alike will now ensure stability for some considerable time and will enable us to continue to present a monthly dental journal of outstanding value, the standard of production of which is unequalled anywhere.

THE SPRING BRIDGE

By G. F. KANTOROWICZ, B.Sc., L.D.S. R.F.P.S.

Lecturer, Conservation Department, The Royal Dental Hospital, School of Dental Surgery, London

THE spring bridge has established a place in conservative dentistry. It is indicated for upper and lower anterior restorations where:—

- a. The aesthetics of the existing dentition is to be maintained or improved;
- b. A diastema is to be maintained;
- c. The teeth adjacent to the missing tooth are unsuitable for use as abutments;
- d. The anterior teeth are sound and the posterior teeth filled, and therefore more suitable as abutments;
- e. Another type of bridge would show too much gold.

The fixed-fixed or fixed-movable bridge may be the method of choice in some of these cases, but, should such a bridge be aesthetically or functionally unsuitable, the spring bridge should be considered, rather than condemning the patient to a removable appliance.

It is not intended here to advocate the displacement of the fixed-fixed or fixed-movable bridge by the spring bridge, but to demonstrate an alternative where more orthodox bridges are unsuitable.

CONSTRUCTION

It is generally accepted that the abutment tooth must be strong, preferably larger in root area than the missing tooth, and be in occlusion. The retainer should be either a three-quarter crown or a full crown.

Upon the construction of the spring connector opinion seems divided. Schweitzer (1947), Wyrick (1952), and Moulton (1956) prefer the short connector, whereas Thompson (1943), Parfitt and Herbert (1955), and Morratt (1956) seem to prefer the long U bar which rests firmly on the mucous membranes. The method of construction of the long connector was first described by Thompson in 1943, when he explained in detail the grooving of the metal model which results in a close adaptation of the bar to the mucous membrane, but, instead of using a platinized gold wire, the bar connector can be cast in hard gold. The

connector is attached just above the gingival margin of the retainer and exerts no pressure on the mucosa at this point.

MECHANICS OF SPRING BRIDGE DESIGN

The problem of spring bridge design is complicated. Forces and movement transmitted to the abutment tooth are of primary clinical significance.

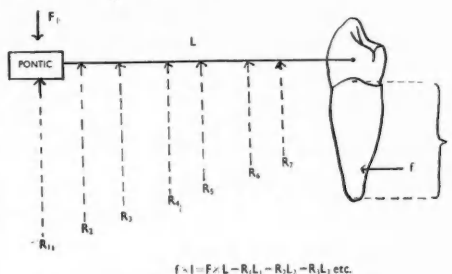


Fig. 1.—Distribution of forces and reaction forces in a spring bridge.

1. The masticatory force exerted on the pontic is met by a reaction. If the connector is rigid, and not resting on the mucosa, the product of the forces on the pontic and the length of the connector is equal to the reaction force in the socket times the length of the active lever of the tooth, i.e., the root. This principle applies as long as the abutment tooth is not moved.

If the connector is rigid, then $F \times L = f \times 1$, and any movement of the pontic is fully transmitted to the roots of the abutment tooth.

If, however, the connector is flexible and supported by the tissue, which it overlies, the reaction forces are distributed over the whole area under the pontic and under the connector as well as along the root of the abutment tooth.

Therefore:

$f \times l = F \times L - R_1 L_1 - R_2 L_2 - R_3 L_3$ etc., where f is the resistance of supporting tissues, and R_1, R_2, R_3 are the reaction forces of the underlying tissues, and L_1, L_2, L_3 their respective distances from the fulcrum (Fig. 1).

2. The movement of the abutment tooth depends on three factors:—

a. The compressibility of the soft tissues up to the limit of tolerance. Soft tissue may be compressed, intermittently and for short

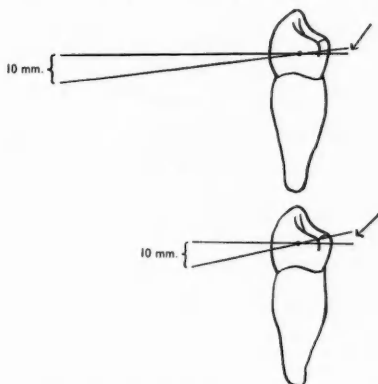


Fig. 2.—Illustrating the potential movement of the abutment tooth with short and long connector.

periods, up to a limit, which depends on the nature and thickness of the tissues and the pain tolerance of the patient.

b. The physical properties of the metal must be of suitable flexibility to allow a certain amount of bending of the bar under load.

c. A short connector will tend to move the abutment tooth over a wider extent than a long connector because it will act as a short lever with its support at the centre of the tooth, and none of the applied force is absorbed by subjacent mucosa. The long lever equally depressed at the free terminal will result in a smaller rotary action at the same fixed terminal (Fig. 2).

RETENTION

The retention of the spring bridge is severely tested when force is exerted in an apico-incisal direction, such as when the patient bites into a toffee and opens the mouth. This movement would tend to put the whole stress on the retainer at an angle which might destroy the mechanical retention. To overcome this weakness, soldering together two retainers in adjacent teeth to give added strength has been suggested (Fig. 3).

The oral hygiene is maintained remarkably well. Spring bridges seen at this hospital several years after construction showed no signs of gingival recession around the abutment teeth or stagnation areas. Floss silk can



Fig. 3.—Two three-quarter crowns on premolars soldered together and used as abutments for a central pontic.

usually be passed under the connector to assist cleaning.

A lingual or palatal rest from the pontic to an adjacent tooth can often be incorporated; it will counteract vertical pressure on the pontic. The use of a small gold inlay under such a rest appears to be common, but experience has shown that this is not always essential.

FAILURES

Morrant (1956), analysing the failure rate of bridges constructed at the Institute of Dental Surgery, London, which included 28 spring bridges, found the latter's failure rate to be slightly higher than that of other types of bridges. As with most retainers, those constructed to cover the clinical crown only may cause a marginal gingivitis which can be avoided by extending the retainer below the gingiva. A stagnation area may be caused by attaching the connector to the retainer near the occlusal surface.

Generally speaking, failures are mainly due to insufficient retention, faulty cementing technique, or too much free leverage on the retainer. If the principle of a long lever, by-passing at least one tooth and resting firmly on the mucous membranes, is observed, the last-named of these faults can be overcome.

If consideration is given to the special constructional factors involved in spring bridgework, and the mechanical and biological principles of general bridgework observed, the failure rate of spring bridges should be no higher than that of other bridgework.



Fig. 4.—A double spring bridge connected by a central bar to act as a stabilizer and to assist in splinting the canines. This bridge has two pontics and is carried by two three-quarter crown retainers.



Fig. 5.—Peg-shaped left lateral before treatment. Note the close bite and natural spacing of teeth.

CASE REPORTS

Case 1.—This patient, treated by Mr. C. S. Godden, under Mr. W. E. Earle at the Royal Dental Hospital, had a traumatic occlusion with a severe periodontal condition as a result of which the two centrals had to be extracted. A spring bridge was advised because the soft tissues would not tolerate a partial denture. The canines were sufficiently strong to act as abutments and three-quarter crown retainers were used. The bar connector was unusual in this case in as much that it had a strengthener connecting both bars. (Fig. 4.)

The patient was seen three years after the bridge was fitted. There was no inflammation of the gingivae, the abutments were normal, and radiographic examination revealed no deterioration of the periodontium. If anything, the periodontal tissues of the abutment teeth appeared to be healthier than before the bridge was fitted. The patient was completely satisfied with the bridge and was able to maintain a high standard of oral hygiene.

Case 2.—This patient had a peg-shaped lateral incisor with a very short root. The anteriors were widely spaced and in the presence of a close bite a denture or crown was contra-indicated. A spring bridge with a retainer on the 6 was fitted after extraction of 12. The spring connector, which is very long, rests firmly on the mucosa and is attached at the gingival margin of a three-quarter crown retainer. (Figs. 5, 6.)

SUMMARY

The literature reveals two general types of spring bridges which have been discussed. The mechanics, design, and causes of failures have been mentioned. Several types of spring bridges have been illustrated and two cases presented.

Acknowledgement.—I am indebted to the Photographic Department of the Royal Dental Hospital for the photographs.

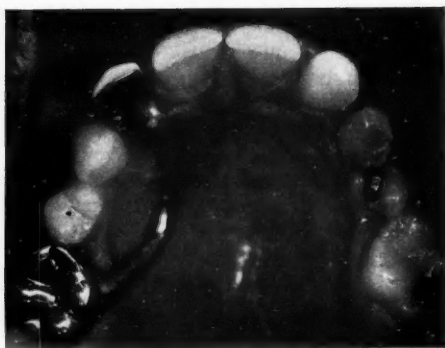


Fig. 6.—The same case as Fig. 5 after treatment. The peg-shaped lateral was extracted and replaced by a long U bar spring bridge anchored on the first molar.

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TUBERCULOSIS OF THE MOUTH

A CASE REPORT

By **H. G. RADDEN**, D.D.Sc. (Melb.), F.D.S. R.C.S. (Eng. and Edin.)

Professor of Dental Surgery, University of Manchester

A male patient aged 33 was referred for investigation and treatment by his dentist, who provided the following history:—

"Three years ago the patient's upper centrals and the lower left lateral were extracted owing to progressive loss of attachment. Eight months later both lower canines and the lower left first pre-molar became loose and, on the advice of a dental consultant, the left canine and pre-molar were extracted and the adjacent alveolus curetted."

Following this treatment the patient was not seen by his dentist until the present occasion, when he was referred to the Manchester Dental Hospital.

He presented as a thin, pale, unhealthy looking person with infra-orbital swelling on the left side, left submaxillary adenitis, and mentioned having had swollen glands on the right side of his neck some time previously (*Fig. 1*). Intra-oral examination showed proliferative ulceration involving the anterior portion of the lower ridge, from which some purulent discharge could be expressed, and a discharging sinus with considerable œdema over the left premaxilla. Radiographic examination showed gross loss of mandibular alveolar bone anterior to the premolars, and incomplete healing of the upper left lateral socket with a possible sequestrum between this and the central socket (*Fig. 2*). Since the remaining teeth were in bad condition, it was decided to remove them whilst investigating the pathology of both jaws. The patient was therefore hospitalized. Under parenteral penicillin and endotracheal anaesthesia the teeth were removed, the tissues over the anterior portion of the mandible were widely opened and the friable granulations curetted down to sound bone. This area was then packed open with gauze soaked in Whitehead's varnish. The area in the upper left premaxilla was similarly opened revealing a circumscribed granulomatous mass which readily shelled out from the labial surface of the bone. No sequestrum was found, and as the cortical plate

appeared intact the wound was partially closed with sutures.

The patient was seen daily and made slow but satisfactory progress for 2 weeks, when he was discharged from hospital and referred for



Fig. 1.—Photograph of patient showing left infra-orbital swelling and submaxillary adenitis.

5 days. On his return, removal of the dressing in the mandible showed the bone to be covered with granulation tissue, but the maxillary area had suffered an acute exacerbation, and was discharging pus. The left submaxillary lymph-nodes were again enlarged and painful, and as his temperature was slightly elevated he was readmitted to hospital where the left

submandibular swelling eventually pointed and was opened and curetted.

Examination of the biopsy material showed it to be infected granulation tissue containing giant cells with an excess of epithelioid cells

scars, "most probably tuberculous in nature, affecting both the right and left upper lobes, and one area suggestive of cavitation". Treatment with streptomycin and isonicotinic acid was then instituted and the patient made a

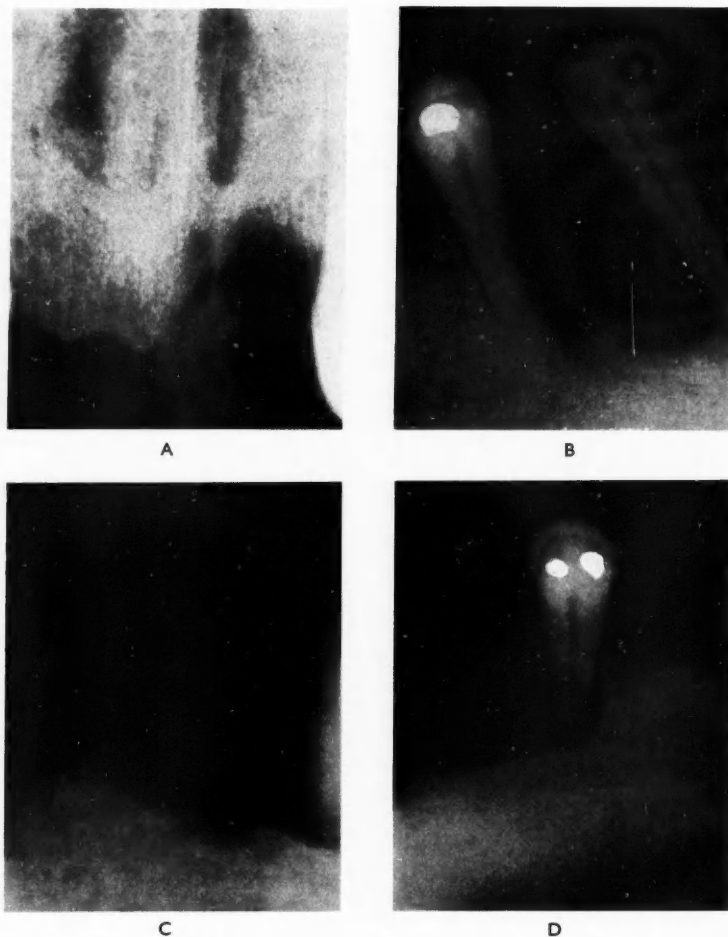


Fig. 2.—Radiographic examination showing: A, Incomplete healing of upper left lateral socket. B, C, D, Gross loss of mandibular alveolar bone anterior to the pre-molars.

(Fig. 3). Mycobacterial colonies suggestive of human rather than bovine tuberculosis had by then been cultured from curettings of the mouth lesions. The Wassermann test had proved negative. Chest radiographs showed fibrotic

satisfactory recovery. Since then he has attended for examination on a number of occasions over the last 2 years and when last seen had regained normal health and was wearing full dentures. The oral mucosa

appeared quite normal and radiographs revealed the development of a normal cortex in both the maxillae. There is some puckering beneath the left mandible where it may be necessary to excise the scar at a later date.

COMMENTS

This case is of interest to the general practitioner, for it clearly shows how the presence of a systemic disease, often unsuspected, when added to that of a dental condition, delays healing in the mouth and complicates the

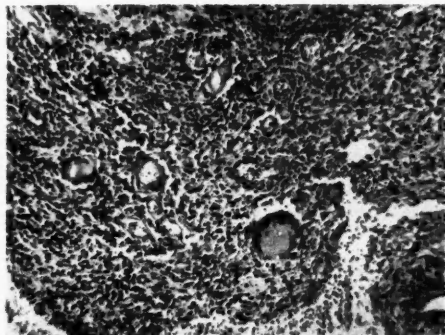


Fig. 3.—Biopsy material showing infected granulation tissue containing giant cells with an excess of epithelioid cells. ($\times 85$.)

whole treatment. Originally the patient was treated for a paradontal condition and, when this treatment proved unsatisfactory, some of the teeth involved were extracted. The writer first encountered the patient in this condition, with what appeared to be osteomyelitis following dental extractions, and it was only after pathological examination and culture that the true nature of the disease emerged, when the appropriate treatment immediately produced satisfactory results. As a secondary complication of pulmonary tuberculosis such lesions may not be unfamiliar to the dentist in tuberculosis sanatoria but the general dental practitioner rarely encounters them and is therefore prone to make a wrong diagnosis for the very reason of not being familiar with the condition. Even more prone to be missed is the primary tuberculous lesion of the mouth to which an annotation in the *British Medical*

Journal of July 21, 1956, draws attention. Miller, in 1953, reported 3 such cases, and Boyes, Jones, and Miller in 1956 diagnosed 7 cases in patients presenting with submandibular adenitis, and posed the question as to whether the primary oral lesion may not be more prevalent than is generally recognized.

Tuberculous mouth lesions occur in a variety of forms, variously described as ulcers with "mouse-eaten" appearance, fissures, hypertrophic types of gingivitis, and tuberculoma. Delayed, or failure of healing with subsequent ulceration and sometimes fistula formation in an extraction wound may be seen. Ulcers are generally shallow with irregular outlines, greyish-pink and granular or nodular bases, but they vary tremendously and may not be dissimilar to a syphilitic lesion or a neoplasm. Tuberculous mouth lesions are described by many as being extremely painful, although Finney and Finney (1925) consider pain is of doubtful significance in diagnosis and is more likely to be present in the advanced stage of the disease. To the dentist, perhaps the most important point to remember is that primary tuberculosis of the mouth may be present as a persistent shallow, painless ulcer which may or may not be associated with trauma, and when such a lesion does not respond to simple treatment and proceeds to glandular involvement it should be fully investigated (Miller, 1953; Galloway and Horne, 1953).

Acknowledgements.—The writer is indebted to the Medical Illustration Department for the photographs and reproduction of the radiographs.

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CORRIGENDUM

SYDNEY BLACKMAN: "Hyperplasias, Epulides, Osteoclastomata," 1956, Vol. VII, No. 4, December p. 106. The legends for Figs. 19 and 20 should be transposed.

IMMEDIATE TORSION: A PRELIMINARY REPORT ON TWENTY-THREE CASES

By Prof. G. E. M. HALLETT

(Continued from page 112)

The method of torsion is described briefly:—

Under local or general anaesthesia the crown of the tooth is seized by special forceps designed to prevent the tooth leaving its socket (*Fig. 3*) and, with a steady and mounting force, a rotatory movement is applied. The tooth may be stubborn or easy. Personally I am

is made and a little solder may be added. The splint is then cemented, left in place two or three weeks, and then removed. There has not so far been in any case of mine any post-operative discomfort. I prefer to make my splints in this way rather than preform them on the model as these can never be correct, for



Fig. 3.—Forceps with beaks specially adapted to grip central and lateral maxillary incisors during immediate torsion.

happier about those that turn easily, but I know no way of determining this reaction beforehand. When the tooth is loosened—that is to say when all the fibres of the periodontal membrane rupture—it will turn very easily. It must not be pressed too firmly in an apical direction. In its new position (which may not be wholly satisfactory labiolingually) it should be steadied and then splinted. There is slight gingival hæmorrhage and I like to keep a generous application of “Pencigel” to the cervical margin. The splint is only partly prefabricated by constructing orthodontic bands on one or more of the adjacent teeth and also to the turned tooth before operation. To the stabilizing teeth is welded a piece of 1 mm. stainless steel wire. Immediately after the torsion in the case of a local anaesthetic, or half to three-quarters of an hour afterwards in the case of a general anaesthetic, the bands are then reapplied and the bar adjusted with pliers until it lies passively upon the band on the turned tooth. A light weld is then made and the splint tried again. If correct a full weld

one is never quite sure exactly how the tooth will move. The prefabricated splint, unless one is very fortunate, is likely to hold the tooth in a position of strain in relation to its socket whilst the one made up after the torsion will not do so. On occasion the tooth has seemed to be so firm immediately after torsion that I have left it thus, unsplinted, merely asking the patient to be careful, and there has been no untoward result (*Case 8, Fig. 7*).

A minimum of five years, in my opinion, must elapse before one can determine reliably the reactions of the tooth and investing tissues. During the turning, if the tooth has been stiff and obstinate, small fragments of cementum may become detached. This would leave bare dentine and a focus for resorption may be created. If the tooth yields easily this is less likely to happen. During a difficult turning extra force is needed. When applying the forceps only turning force should be applied as any intra-alveolar intrusion of an immature tooth into its socket should be avoided. Such force could easily cause compression of the

very delicate pulpal tissue against the base of its socket, which could produce in turn intra-pulpal hæmorrhages which might lead to greater degenerative changes than otherwise. This is a point which I did not appreciate in my earlier cases. Also the pressure of the beaks of the forceps on the tooth crown momentarily distorts the underlying flexible

If turned too soon, say in the stage of development shown in Fig. 2 1, not only may pulpal compression be easily caused but a large area of Hertwig's sheath will be torn and deformed. At the stage shown in Fig. 2 2 the sheath is contracted to a smaller "tube" which may be more resistant to rupture, though a slight twisted dilaceration must be inevitable. At



Fig. 4.—Chart showing progress of all cases so far undertaken. Note each case starts on the same base line. X indicates extraction; square end to line indicates extraction necessary due to abscess; pointed end to line indicates case clinically satisfactory; white areas in black lines indicate radiographic signs of resorption.

dentine. This, if too severe, can result in sharp odontoblastic reactions which may be resolved as a thick layer of secondary dentine. Compression of the crown by the forceps may also fracture the enamel. By interposing lead foil between the blades this is less likely to happen.

Because, personally, I like to turn a tooth in a firm socket and at the same time have as open an apex as possible, I usually choose a stage of development where the root is at least three-quarters completed. This seems to me to be the optimum stage of development.

the stage in Fig. 2 3 rupture or strangulation of the pulpal vessels can hardly be avoided and the risk of poor or non-revascularization is very high, particularly with second incisors which often have an apical bend in the root. Some time after the torsion small roughnesses may be noted on the sides of the root when viewed radiographically. These are resorption areas. They may progress very slowly, or they may fill with cementoid and the Sharpey's fibres become reattached and a *status quo* arise. Naturally if the resorptions are labially or palatally placed they will be very difficult or

impossible to interpret from the roentgenogram in the early stages, though they may become quite apparent later on as they become more advanced (*Case 17, Fig. 8*). The resorption may become extensive, but nevertheless the tooth remains firm over many years and quite symptomless. The apex may be watched completing. This is, of course, encouraging and it does usually occur, and may do so despite the fact that the pulp is undergoing slow degeneration. It may also continue to respond in a lively fashion to thermal tests though much calcification has taken place within the pulp chamber. This is in accordance with the observations made previously by Bocquet-Bull on the case of immediate torsion which had been tested by Cutler and commented upon by Visick (*vide supra*). This is one of the interesting observations found not only in these teeth but also sometimes in replanted teeth and in pulpotomized teeth. The pulp may eventually wholly calcify, being filled with a form of pulp bone.

What is the general assessment of these cases on the basis of this interim report?—and here I must make it clear that my ultimate aim is to follow at least 20 of these cases for 8 years, and if possible I hope to follow 25 cases. Originally I had hoped to follow them for 10 years. This may yet be possible, but so long as National Service exists and takes our young men in at 18 it becomes very difficult to pursue serial cases in boys much beyond 17. So that as most of these teeth are turned at age 9, only 8 years are available.

Firstly it may be seen from many of these cases that they react in very variable ways. With the same technique of turning and stabilization some show resorptive changes to a considerable degree and others practically none. In some, the resorption has not become apparent until three or four years after turning. Degenerative changes in the pulp leading to necrosis definitely followed in one case (*Case 6*) though it took four years to do so. A second failed, having had a severe blow a year after turning (*Case 2*). Vitality is maintained in the great majority, even in those where resorptive changes may be advanced. One of the definite disadvantages is that, if resorption takes place,

repair may be followed by ankylosis. The tooth seems then to remain at its original level in relation to the cranial base, being left behind by the descent of the occlusal plane (*Cases 16, 17, Fig. 8*). Since children vary enormously in the amount of descent of the occlusal plane during facial development, submergence will be much more pronounced in those children who develop great facial depth than in those who do not. It is an argument for turning at the last possible moment compatible with an open apex. Occasionally the enamel is chipped. This occurs because some teeth are much more resistant to turning than others and greater force is necessary. I have one patient in whom the right lateral incisor turned quite easily. This latter easily-turning one produced an excellent result—whilst the difficult tooth gave a poor one (*Case 16*). The possible relationship between the detachment of cementum and subsequent resorption in these difficult cases has been mentioned.

The gingival condition has remained uniformly good and in no case has any deep or significant pocketing resulted. The periodontists should be interested in this finding. At the termination of the eight-year period of a sufficient number of cases I hope to measure comparatively all the gingival crevices.

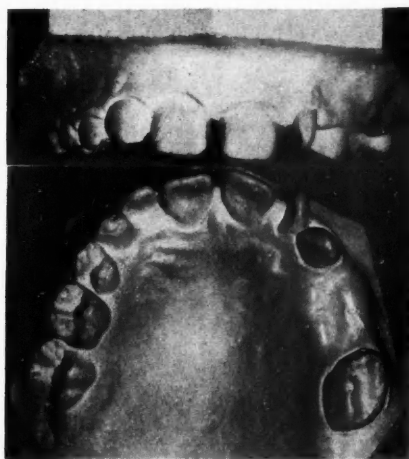
It will be seen that in almost all my cases I have chosen those teeth which were a very serious problem from the rotational point of view. Originally, and in error (as I now know), I also made a stipulation, as it were to myself, that I would only turn teeth where a canine was blocked out. So that, if after six months to a year, should the turned tooth prove satisfactory I could then extract the first upper premolar and let the canine come into place. If it should not be satisfactory then I could extract the turned tooth and let the canine come into the lateral space. In a word, I tried to ensure that I had a second line of defence. I now know that this is not sound reasoning for it takes much longer than one year to be sure of a good result and indeed it is better to wait for three. So that, long before that time has elapsed, something quite definite may have to be done about the blocked out canine!

CASE REPORTS

Case 1.—W. M. (male). $\overline{12}$ rotated 110° . Turned age 11 years. Root nearly complete. Splinted. Has been satisfactory for $8\frac{1}{2}$ years. Vitality and thermal tests normal. Has had small distal filling placed 5 years ago. Pulp chamber slightly reduced in comparison with $\overline{21}$. Some roughening of root distally. Slight resorption of cementum distally just below gum margin. Pulp shows

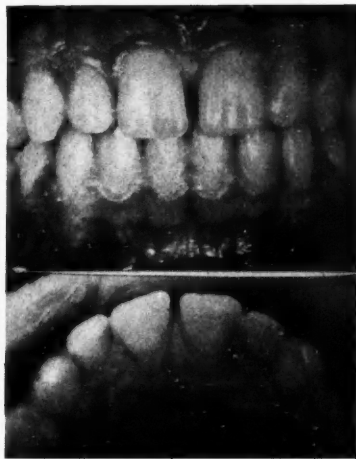
splinted. Satisfactory $7\frac{1}{2}$ years. Vitality responses normal. Suggestion of slight resorption distally. Apex a little blunted. Lamina dura continuous medially. Slightly discontinuous distally. Occlusal level satisfactory. Distal filling.

Case 4.—M. O'B. (female). $\overline{21}$ rotated 80° . Age 9 years 5 months, root three-quarters developed. Tooth turned, splinted. Seven and a half years satisfactory.



19. 5. 49

A



12. 4. 56

B



15. 5. 48

C



28. 1. 49

D

12. 4. 56

E

Fig. 5.—Case 4 (see Fig. 4). A, $\overline{12}$ before torsion; B, $\overline{12}$ seven years later; C, $\overline{321}$ before torsion; D, $\overline{12}$ splinted after torsion; E, Seven years later, aged 15 years, six months.

slight areas of calcification. Colour excellent. Gum margin normal. Tooth quite firm. Occlusal level satisfactory.

Case 2.—P. H. (male). $\overline{11}$ rotated 90° due to supernumerary. Large teeth. Rotated at age 9 years 4 months. Root half formed. Satisfactory 11 months after but patient suffered severe blow followed by acute abscess. Tooth had to be extracted 1 year after torsion.

Case 3.—J. R. (male). $\overline{21}$ rotated 90° . Age 9 years 5 months, root three-quarters completed. Tooth turned,

Normal response to vitality tests. Lamina dura intact. Pulp size normal. No histopathological change detectable. Occlusal level normal. (Fig. 5.) (Tooth turned by Mr. W. H. Littlefield.)

Case 5.—H. V. (male). $\overline{11}$ rotated 70° due to presence of supplemental $\overline{21}$. Age 8 $\overline{11}$ rotated and splinted and right upper supplemental incisor extracted. Later, left upper supplemental extracted. Great improvement in appearance. Patient lost sight of for 3 years due to back injury. Seen again $6\frac{1}{2}$ years after torsion. Teeth satisfactory. Reaction to thermal tests normal. Gum

condition excellent. Occlusal level normal. Pulp condition—evidence of slight calcific change on roentgenograms. Apices complete. Left upper canine ectopic. Small brown hypoplastic patch on 1 near gingival

Case 7.—R. H., male. $\frac{1}{2}$ rotated 90° . Age 12, root complete. Immediate torsion and Class III palatal invagination was also present. After torsion tooth was found to be inclined too far labially. After 6 months

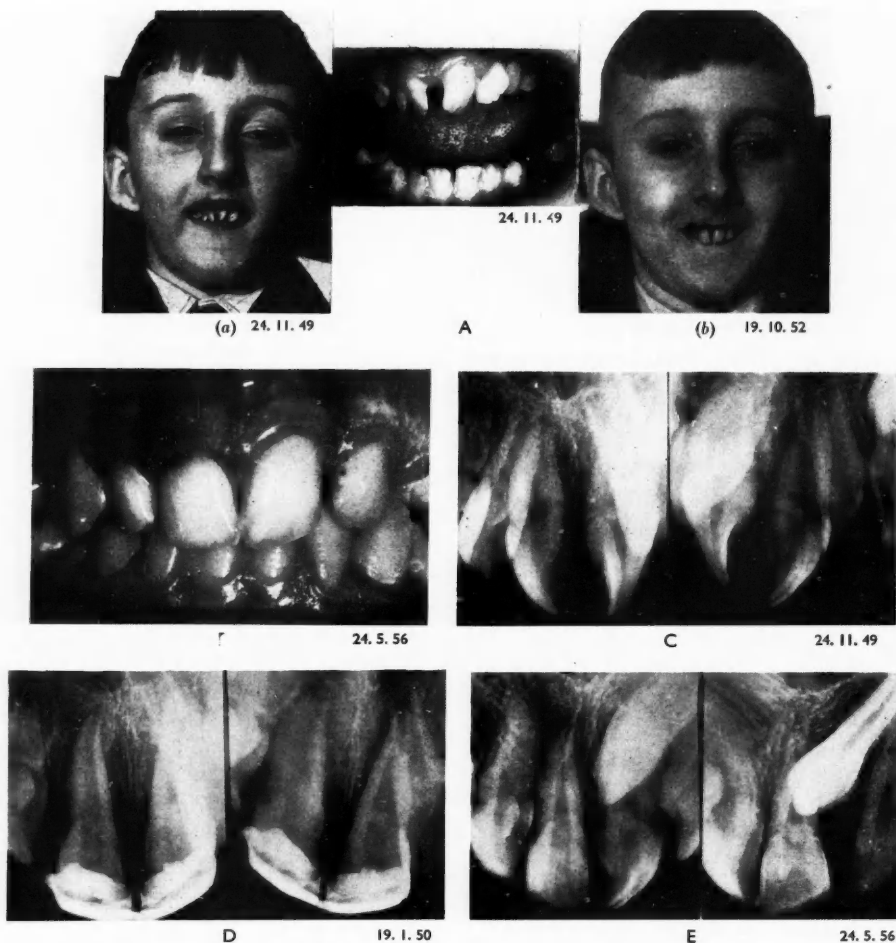


Fig. 6.—Case 5 (see Fig. 4). A, (a) Before torsion; (b) Two years after torsion. B, $\frac{1}{1}$ after six years (supplemental $\frac{2}{2}$ have been removed). C, Skiagram before torsion. D, After splinting. E, Six years later.

margin. Possible slight resorption distal surface of root $\frac{1}{1}$ and medial $\frac{1}{1}$. (Fig. 6.)

Case 6.—E. C., female. 90° rotation $\frac{1}{1}$ due to mesiodens. Age 8, three-quarters root development. Tooth rotated and splinted. Position after rotation only fair due to angulation of socket. Three years later evidence of considerable resorption radiographically. Five years later tooth developed acute abscess and was extracted. This case must be regarded as a frank failure.

orthodontic pressures were applied to move tooth in a palatal direction. Four different appliances were tried but the tooth would not move. This tooth had been very resistant to turning. It was finally removed after 4 years and a bridge was inserted. The tooth was extracted quite easily and there was no ankylosis. Sectioned for histological examination. At time of removal was symptomless and gum condition excellent. Occlusal level also satisfactory.

Case 8.—J. W., female. 21 rotated 45°. Age 9, root three-quarters complete. Tooth corrected by immediate torsion. After turning seemed so firm with complete absence of bleeding that no splinting was applied. Healing uneventful. Nearly 3 years later tooth colour

Slight evidence of roughening of root distally but compares well with unturnd 22 both in pattern of periodontal space and pulp size. Has had small filling inserted medially. Reacts well to thermal tests. Occlusal level normal. Case very satisfactory.

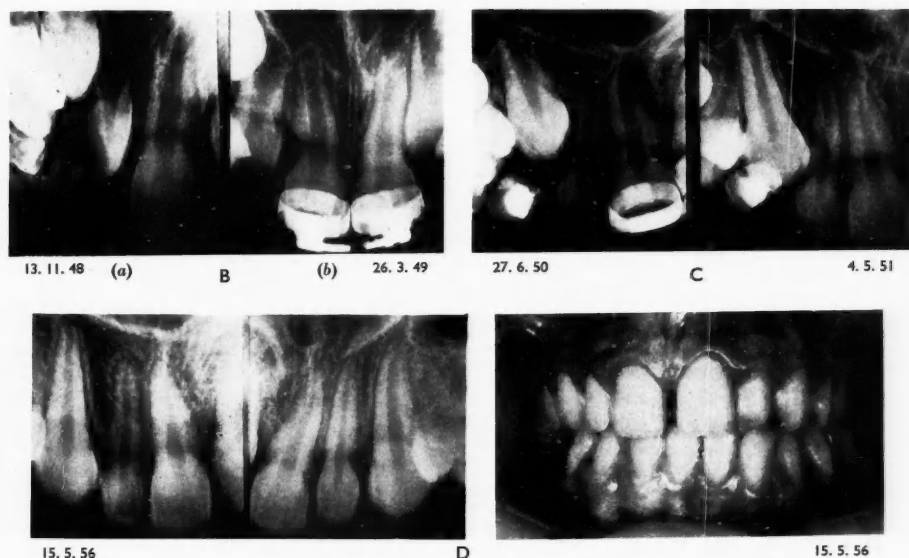
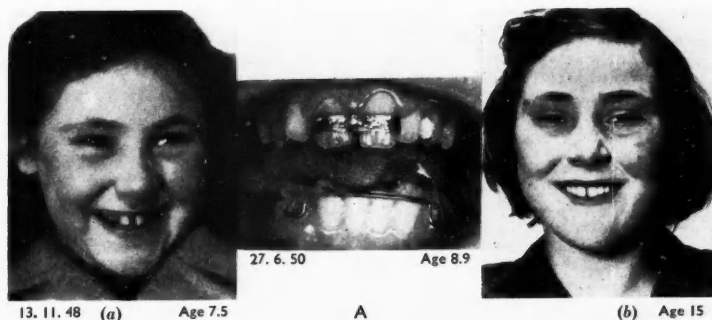


Fig. 7.—Case 8 (see Fig. 4). A, 21 before torsion: (a) Before closure of diastema 111; (b) Six years later, aged 15. B, (a) 21 erupting in rotated position; (b) Diastema has been closed and has been held. C, Left tooth turned but firm and not splinted. D, April, 1956, six years later.

and occlusal level normal. Responsiveness to vitality tests normal. Apex has completed. Some slight evidence of resorption. Six years later tooth still clinically very satisfactory. Radiographically, evidence of some slight resorption though this is not severe. Occlusal level and gum condition still excellent. (Fig. 7.)

Case 9.—M. H., female. 21 rotated 90°. Root three-quarters complete. Splinted. Satisfactory 5½ years.

Case 10.—M. C., male. 11 rotated 80°. Cleft palate case, right side. Absent 21. Tooth turned age 8. Root half complete. Has been satisfactory over 5 years. Great improvement in position though tooth still remains (together with 11) lingual to 111. Root has completed its apical development and no evidence of any marked resorption so far. Occlusal level is satisfactory. This tooth may be removed later for histological investigation when a prosthesis is fitted.

Case 11.—P. B., female. $\overline{1}$ rotated 70° . Cleft palate case, left side. Tooth turned and splinted—root five-sixths complete. Premaxillary teeth lingual to lower incisors. Great improvement in appearance especially after medial corner of turned tooth had been stoned. Has been satisfactory over 6 years. Responds well to



A

28. 5. 52



B

28. 3. 56



28. 5. 52

C

18. 6. 52



13. 1. 53

D

10. 4. 54

Fig. 8.—Case 17 (see Fig. 4). A, $\overline{2}$ before torsion. B, Three and a half years later; at time of torsion incisal edge was at occlusal level.

thermal tests. Periodontal condition satisfactory. No evidence of resorption.

Case 12.—C. C., female. $\overline{1}$ rotated 45° . Cleft palate case left side. $\overline{2}$ malformed and extracted. Tooth turned age 9. Root five-sixths complete. Satisfactory 4 years with slight indication of calcification in pulp chamber. Distal filling placed in crown. Periodontal condition normal with no evidence of resorption. Tooth extracted after 4 years in preparation for prosthesis. It was hoped to have this tooth for histological examination but due to an accident of understanding the tooth was thrown away by practitioner after extraction. This tooth had reacted normally to vitality and can be considered as a satisfactory case.

Case 13.—G. C., male. $\overline{1}$ rotated 45° . Cleft palate case, left side. $\overline{2}$ absent. Tooth turned and splinted age 9-4. Root three-quarters complete. This tooth was somewhat hypoplastic in appearance. Apical development only partially complete after torsion and tooth did not react well to thermal tests. After 2 years pulp canal was opened and the pulp found to be dry and degenerate. Root filled. After 5 years tooth extracted for denture. Tooth at the time firm, gingival condition good and occlusal level satisfactory.

132

Case 14.—D. McC., male. $\overline{1}$ rotated 75° . Cleft palate case, left side. Malformed lateral incisor present which was extracted. $\overline{2}$ malformed which was extracted. Tooth turned and splinted age 7 years 11 months. Root four-fifths complete. Apex has since completed development and tooth has been in place for 5 years. Occlusal



E

28. 3. 56

level good. Thermal reactions normal. Periodontal membrane normal. No evidence of resorption. Edge to edge bite. This case seems to be quite satisfactory.

Case 15.—M. W., female. $\overline{1}$ rotated 150° . Tooth turned and splinted—age 8 years 4 months. Root three-quarters complete. Condition after turning very much improved but not 100 per cent satisfactory. Apex has completed with some dilacerations. Root canal lumen has narrowed. Tooth reacts well to thermal tests. Slight evidence of medial resorption. Gum condition good. Occlusal level satisfactory. A very severe case of rotation which would have been extremely difficult to treat by any other way. Has been satisfactory for 5 years and may be considered as a successful case.

Case 16.—M. B., female. 2 $\frac{1}{2}$ rotated 90°. 2 $\frac{1}{2}$ turned age 8 years 8 months. Root five-sixths complete. Splinted. 1 $\frac{1}{2}$ turned age 10, five-sixths complete, splinted. 2 $\frac{1}{2}$ turned quite easily. 1 $\frac{1}{2}$ very resistant and small chip fractured off enamel incisively during turning. 2 $\frac{1}{2}$ has been quite uneventful, reacts well to thermal tests and shows small area of resorption distally and just below cervical margin which has not progressed markedly for 3 years. Occlusal level and gingival condition satisfactory. 1 $\frac{1}{2}$ has completed root development but began to show root resorption one year after turning. This has progressed extensively though the surrounding bone has remained radiographically normal. This tooth has remained at its original level of development and is in a condition of infra-occlusion. Patient was advised to have tooth extracted but preferred not to do so. The crown was therefore lengthened artificially with a three-quarter crown and acrylic facing. It therefore appears abnormally long. This tooth continues to react in a very lively way to thermal tests. Gum margin good. This case is interesting in view of the dissimilar results following similar technique in the same patient.

Case 17.—R. N., male. 2 $\frac{1}{2}$ rotated 90°. Turned age 9, root four-fifths complete. Splinted. Tooth resistant to turning. Root development completed. About 1 year later began to show area of resorption distally which spread fairly extensively although apical half of root remained quite normal. Tooth quite symptomless but remained at original occlusal level and developed marked infra-occlusion. For this reason extraction was advised 3 $\frac{1}{2}$ years after turning. At time of extraction tooth felt "ankylosed" and crown parted readily from remainder of root. The coronal portion of the pulp on macroscopic investigation looked normal but root portion may need surgical removal. As it is symptomless and there is no sepsis present the root is being left in situ for the time being. This case must be regarded as a frank failure. (Fig. 8.)

Case 18.—D. H., male. 1 $\frac{1}{2}$ rotated 90° due to supernumerary. Tooth rotated age 9 years 1 month when four-fifths completed. Tooth stabilized. Has remained symptomless, reacts to thermal tests normally, gum condition excellent but after 3 years tooth is now beginning to show signs of infra-occlusion. It is anticipated that the infra-occlusion will become more marked in the course of the next 2 years. The full success of this case must be regarded as doubtful.

Case 19.—D. K., male. 1 $\frac{1}{2}$ rotated 45°. Cleft palate case, right side. Supplemental 2 $\frac{1}{2}$ present and rotated also. Supplemental 2 $\frac{1}{2}$ extracted. 1 $\frac{1}{2}$ turned age 8 years 6 months, root three-quarters complete. Splinted. Position after rotation only fair. Four and a half years later position of tooth only fair because of angulation. Some possible calcification of pulp canal. Apical development complete. Tooth reacts well to thermal tests. No resorption apparent but difficult to assess because shadow of root overlies that of adjacent central incisor. Extraction advised but patient prefers to retain tooth for time being. It is hoped that this tooth will become available for histological section at some later date. Case moderately satisfactory.

Case 20.—D. A., female. 1 $\frac{1}{2}$ rotated 80°. Tooth turned age 8 years 3 months, five-sixths complete. Splinted. Has now been rotated 1 $\frac{1}{2}$ years. Condition satisfactory. Root apex has been completed. Periodontal membrane

seems normal radiographically. Occlusal level normal. Responses to thermal tests normal. Gingival condition good. No signs at present of focus of resorption. This case must not be considered as satisfactory until at least another 2 $\frac{1}{2}$ years have elapsed.

Case 21.—C. G., female. 2 $\frac{1}{2}$ rotated 90°. Tooth somewhat diminutive. Tooth rotated five-sixths complete. One and a half years later tooth normal in appearance and reactions to thermal tests. Lamina dura satisfactory. Case so far satisfactory but no further judgement can be made upon this until another 2 $\frac{1}{2}$ years have elapsed. *Vide* remarks on previous case.

GENERAL CONCLUSIONS

In this limited number of cases it would be unwise to be too dogmatic on the outcome in general of immediate torsion. This paper must in no sense be construed as an effort on my part to popularize this very old method of treating cases of rotation. It is claimed, however, that, as far as I am aware, more cases of immediate torsion have been followed through for a longer period than has been done previously and a considerable amount of clinical and radiographic material is now at my disposal. Ultimately there will also be some human histological material. Similar torsion experiments have also been carried out on monkeys but the results of this work is outside the scope of this paper as I thought in the limited time available it would be better to confine myself to the concrete facts and known human clinical histories.

Immediate torsion is interesting not only for itself alone but also for the indications it gives us as to the reactions of investing tissues of the tooth after accidental trauma, subluxation, and so on. Briefly then, it can be said that immediate torsion on single rooted teeth can be demonstrably successful and teeth so turned are now serving perfectly well with good vitality without sepsis, change of colour or paradontal break down more than seven years after treatment. In most cases some resorption of the root takes place which is usually followed by repair tissue and eventually a *status quo* is established. In a few cases the resorption proceeds at a greater pace than repair and the root largely disappears. As a result of ankylosis the tooth may become fused with the investing alveolar bone and fail to continue eruption along with the

adjacent teeth. A marked disparity of occlusal level then becomes apparent which is aesthetically displeasing. Very occasionally the tooth may die and abscess formation supervene. The enamel may be chipped in certain cases of stubborn teeth. The gingival condition seems to remain uniformly excellent. It is suggested that in cases of gross rotation, cleft palate and others with supernumerary involvement immediate torsion may justifiably be employed. Also in some cases where the patient may have to travel long distances and regular attendance is difficult or impossible this method may be used to correct badly rotated teeth providing that the position is clearly explained to the parent.

Acknowledgements.—Thanks are due to the Department of Photography of the Newcastle upon Tyne Dental Hospital, for the production of the photographs illustrating this paper.

DISCUSSION

The Chairman said just recently there had been a resurgence of interest in the surgical treatment of local malocclusions of teeth, but by autografts and homografts, and as Professor Hallett had said this was really a form of autograft rather than a simple rotation. It had indeed been a most interesting and timely paper.

Mr. Watkin said he had never rotated a tooth surgically but one point had struck him in the case which Professor Hallett had pointed out of a tooth which did not erupt; he was not quite sure whether that was not caused by the presence of the tongue which seemed to be quite big and was protruding.

Mr. Breakpear said it would appear that the teeth which were difficult to turn, presumably because of the shape of the bony socket, were just the very ones which might be expected to give a better result by the more orthodox methods. It would be interesting to know whether Professor Hallett agreed with that, and if so whether there was any way of telling beforehand which teeth would respond better.

Mr. Pilbeam said he was particularly interested in the history of the cases as given by Professor Hallett in regard to Bocquet-Bull's paper read before the Society in 1921.

He had seen Bocquet-Bull do a number of immediate torsions, in which he always used unvulcanized rubber instead of lead foil to protect the tooth and always used a pre-arranged splint because it gave greater support. After some little time Bocquet-Bull did tell him that he had given up the practice because the results were so disappointing.

Mr. Hamish Anderson congratulated Professor Hallett on his excellent paper but wondered whether he had taken into consideration the aetiology of the displaced teeth. Might some of them not be due to the deciduous

At the time of going to press a further six months have elapsed since the delivery of this report. It is of interest, therefore, that the position has remained exactly as in May. There has been no further changes of any significance in that time.

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teeth? Secondly, as the tooth was erupting it might be an occlusal contact, in other words a slight rotation, and perhaps that might have some influence on the results.

Mr. Logan said the question of the rotation of teeth was an extremely interesting one and he had listened with great pleasure and profit to Professor Hallett's very extensive review of the subject. He did not agree, however, that the rotation of a tooth in its socket could be regarded as a homograft: in his opinion the true homograft was where one extracted a tooth and made a new socket for it and replanted it. It was an extraordinary thing that if one did that, every case in the end failed. His own experience was that a tooth replanted in a new socket lasted about four years when, the root having been absorbed, the crown fell. If, however, one rotated a tooth in its socket the root sometimes showed greater or less loss of substance by absorption, sometimes not. It would appear that the critical point lay in the presence of the periodontal membrane and it was interesting to speculate why it was that the root was not always absorbed. His own view was that it was probably due to the epithelial elements in the periodontal membrane. If they were destroyed root resorption would occur.

It would appear that the epithelial attachment was fractured and re-attached itself in some way and it was very interesting indeed to see cases which had lasted for such a long time, and even cases where ankylosis was taking place.

His own experience was that the dangerous period occurred after the fourth year and he believed that there is a spate of absorptions after this time.

Mr. Kettle said that in his opinion the rotation of incisors was a local manifestation of a general orthodontic problem and that it was of no value to attempt treatment of that local symptom until the orthodontic

problem as a whole was treated. When that was done the rotated incisors would almost invariably look after themselves in the course of the orthodontic treatment. If the results which Professor Hallett demonstrated had shown the loss of one tooth then in his view the method should be condemned.

Mr. Walpole Day said in order to get the thing into perspective it should be realized that all the cases which Professor Hallett had shown were cases where heroic methods were necessary to correct them, and it would be interesting to know whether Professor Hallett or anyone else had a comparative series of cases which had been treated by other methods, with the appropriate X-rays, showing how many of those cases also had failed. Of the series of cases shown by Professor Hallett four had failed—how many had failed by other methods such as twin arch or similar fixed apparatus?

Mr. Wilson said in the cases shown he did not think there were any central incisors with root resorption—they were all laterals—and he wondered whether there was any significance in that.

Professor G. E. M. Hallett in reply to Mr. Watkin, said he did not think so in that particular case. There were in fact two cases where that had happened; these had involved teeth which had been hard to turn and he had anticipated little trouble at the time of turning but it was only later that the disparity in occlusal level had developed. He felt sure it was due to an ankylosis similar to the ankylosis seen in submerged deciduous teeth.

In reply to Mr. Breakspear he said he was unfortunately unable to help in that respect. He had already cited a case where a tooth had been splinted on one side. In that case both teeth were rotated through a similar number of degrees and the one on the right had moved into an excellent position with no orthodontic help at all, which in fact had rather surprised him, whereas the other one, which had been difficult to turn, was the one on which he had to put the rather peculiar-looking elongation (of which he was not particularly proud). However, the patient insisted upon keeping it. He only wished he could determine that particular point.

In reply to Mr. Pilbeam with regard to splinting, Professor Hallett said he had done about three cases which he had not splinted and they had been satisfactory and this had left him wondering whether with ankylosis tending to develop round little detachments of cementum it might be that a slight movement would be advantageous whereas if the tooth were too rigidly splinted, after a resorption cavity had been formed redeposition of osteoid with consequent fusion would be facilitated. That was a thought which had occurred to him quite recently as a result of his experience and also of one or two of his animal experiments.

Replying to Mr. Anderson, he said in the case to which Mr. Anderson referred there had been two supernumeraries in the palate which had had to be removed first and indeed in some of his cases supernumeraries had been important factors in causing incisor rotations. In addition, in that particular case the patient had very large teeth, and that might also have been a factor which was against him, for although he had actually regained space there, hoping to extract further back, he had probably not expanded quite enough before turning the tooth. The patient was a very active boy.

In reply to Mr. Logan, Professor G. E. M. Hallett said he had done other forms of surgical correction of teeth.

He remembered a Class III case where a young boy had two supernumerary teeth erupted in the mid-line whilst his central incisors had erupted very much to the side. He had extracted the two supernumeraries and then extracted the two central incisors, implanting them in the supernumerary sockets which he had enlarged with bone burs. The Class III tendency was much improved. That had now been done just over four and a half years and it was very interesting. Patchy resorption had developed on both these teeth, but he still thought that the operation had been justified as in their new position they had improved the bite and exercised a measure of control over the lower incisors. In fact the Class III tendency was much improved. He had expected to have to extract these incisors after about two years. However, after four years they were still very firm with no sepsis, and might remain so for another two.

The other was a replantation case where he had replanted two very young central incisors which unfortunately had been dislodged; there was galloping resorption of one tooth, which fell out, but the other one was, after five years, still there. It now had no root, and no dentine in the crown, the root and dentine having progressively resorbed and been replaced by bone. The crown looked quite normal in the mouth and was firm as a rock. He had given up trying to forecast the outcome of these sort of cases in children.

With regard to the epithelial attachment, that obviously must be ruptured, but healing must take place. This had been the least of the problems. As to keeping track of the cases, as they came in they all started on the base-line of the wall-chart and then they were checked and X-rayed every three months so that the chart became self-recording. That was why he had shown the results in that form.

Mr. Kettle was perfectly entitled to his own point of view: he had merely shown the cases in order that people might make up their own minds. He wanted to make it perfectly clear that he was not urging them to rotate teeth surgically.

In reply to Mr. Walpole Day, he said he had quite an amount of data because naturally one had followed cases where severe rotations had been undertaken by more ordinary methods but unfortunately they would take too long to mention at the present time. It was very difficult to get an absolute parallel with most of the type of cases which he had previously shown. As to whether there were more failures by the present method he had not yet got that material properly collated but he agreed that it was important and he hoped to get the results in due course.

In reply to Mr. Wilson he said that was quite true. He thought the central incisors showed less tendency to resorb, but the number of cases was too small, although he agreed that the central incisor had a very much rounder cross section. He thought in the case of the lateral incisor the canine was very often inclined forward and might be a factor in inducing distal resorption. It would be remembered in the examples shown that two or three of the teeth were at right angles to normal and he had thought it was justifiable at that time to turn the teeth by that method.

The Chairman thanked Professor Hallett for his paper and all the members who had taken part in the discussion, whose enthusiasm had shown how interesting the paper had been.

HEREDITARY OR IDIOPATHIC HYPERPLASIA OF THE GUMS*

By MARTIN A. RUSHTON, M.D., F.D.S.

UNDER these titles are described conditions which have also been called general congenital hypertrophy of the gums, elephantiasis or gigantism of the gums, fibromatosis gingivæ, symmetrical fibroma of the palate, multiple epulides, etc. They are conditions in which from infancy, childhood, or adolescence the fibrous tissue of the whole gums or of a substantial part of them is grossly thickened, usually without evidence of inflammation and without known cause, and in which the teeth remain partly covered or do not erupt.

EARLY CASES

The early cases still quoted in some studies and bibliographies are not all descriptions of the same condition, although a few authors such as Creig (1914) and Perkoff (1929) have pointed this out long ago. It seems likely that the first recognizable case was that reported by Gross (1859), Professor of Surgery at the Jefferson Medical College of Philadelphia, as seen in 1855 in a boy of 10 years of stunted development, ill-shaped head, large abdomen, and, as he added later (1873), of feeble intellect. The overgrowth of gum had first been noticed at 9 months and reappeared after several operations. It was distributed all around both jaws and was sufficiently developed to interfere with speech.

Salter (1870) reported seeing Pollock's case in 1859 at St. George's Hospital, London. In this girl examined at 8 years it was said that after 5 weeks of life when six teeth had appeared it was noticed that the gums were thick and puffy. When seen by him, a large pink smooth mass protruded from the mouth, chiefly from the upper jaw, although a similar condition extended all along both jaws from the alveolar borders, which were also

expanded and prolonged. He thought that the permanent teeth removed at operation were excessively large, especially the upper central incisors—"larger than any I have before seen removed from a female mouth". The child was abnormally hairy from birth and also had fits, thought to be epileptic.

Other early cases which appear to fall into the same category are Waterman's (1869) two women, one of whom was feeble-minded and remarkably hairy and had been exhibited in Boston, Mass., as the "bear-woman" ten years before; MacGillivray's (1871), also in a woman; and probably Heath's (1868) girl of 4½ years, and one of his young men of 26 years (1897), both of whom Creig (1914), however, would exclude. Heath's other young man of 26 years, in whom the enlargement was confined to one side of the mandible, slightly overlapping the midline, seems more likely to have been of another sort, possibly a neurofibroma.

An early case frequently quoted is Erichsen's (Heath, 1868) with affection of the incisor region in both jaws at 2½ years, the abnormality being first seen at the age of 7 months when the teeth began to appear. This is the same girl as later reported by Murray (1873), together with an affected brother and sister, as molluscum fibrosum, and again later by Whitfield and Robinson (1903). In addition to the enlargement of the gums, there were multiple fibrous tumours of the fingers and toes, face, scalp, back, and limbs, and nerve deafness (*Fig. 1*). Heath thought that the deciduous teeth were enlarged, but Murray does not suggest this. In these children the gingival enlargement was an early incident in familial neurofibromatosis. The parents were cousins.

In 1886 Humphry reported on a case of unilateral hyperplasia of the gums associated with homolateral enlargement of tonsil, soft palate, ear, lingual papillæ, lips, etc., and some

* Being the Presidential Address to the British Society of Periodontology delivered on Oct. 15, 1956.

anomalies of digits and skin. This was clearly congenital hemifacial hyperplasia, and although Humphry made a notation of the various cases of "hypertrophy of the gums" then known and certain comments on them, which are still quoted, his final note seems to



Fig. 1.—Erichsen's case of neurofibromatosis after Murray (1873).

recognize that his own case is really comparable to Friedrich's (1863) and other cases of congenital overgrowth of one side of the face.

Thus from the early cases several different pathological conditions can at once be separated: idiopathic hyperplasia of the gums with and without hypertrichosis; neurofibromatosis; and hemifacial hyperplasia. Reports of gingival enlargement subsequently became quite numerous and included some which appear to have resulted from chronic inflammation alone.

HEREDITY

It is evident that in some families the predisposition to idiopathic hyperplasia is inherited. The number of pedigrees available is not large. The earliest is that of Nasse (1895) in which there were 5 marriages between affected and normal persons with

15 offspring, of whom 10 were affected. The best pedigree is that of Weski (1920) covering 5 generations, in which there were 14 marriages between affected and normal persons with 15 affected (9 females, 6 males) and 23 normal offspring. Inheritance was only through affected parents of either sex. Mirolli (1931) observed 4 generations with 10 marriages between affected and normal persons producing 28 offspring, of whom 11 were affected in various degrees (and some perhaps doubtfully) without sex difference. Savara, Suher, Everett, and Burns (1954) reported a family in which the father and 6 out of 8 children had the defect. In Raynal's family (1909) there were 4 marriages in 4 generations between normal and affected persons with 7 offspring mentioned, of whom 6 were affected, 3 of each sex. Cernéa, Garlopeau, Marie, and Sand (1955) report a family in which there were 3 marriages between affected and unaffected persons with 12 offspring, of whom 6 were affected. One unaffected woman is shown as transmitting the defect. These make a total of 54 affected and 54 normal offspring from 37 marriages between affected and normal persons. Other less complete records refer to brothers and sisters affected, fathers or mothers and children, and a nephew and aunt. Konjetzny (1922) and Ruggles (1924) refer to families affected over several generations, but give no pedigrees.

It seems likely that the hereditary factor is a dominant gene. Sporadic cases are not uncommon and most records give no information about affected relatives or state that none were known.

SEX

Among affected patients the sexes are equally represented. Thus, of 109 published and unpublished cases in which the diagnosis does not admit of much doubt, 54 were males and 55 females.

IDIOPATHIC HYPERPLASIA OF THE GUMS WITH HYPERTRICHOSIS

The number of cases on record in which the hyperplasia of the gums has been accompanied by hypertrichosis is small compared with the

number of cases in which it has not. Nevertheless, the association has now been observed many times: Salter's and Waterman's cases have been mentioned and to these may be added those of Parreidt (1900); Weski (1920), a family traced for five generations; Perkoff (1929); Ziskin and Zegarelli (1943); Byars and Sarnat (1944); Thoma (1954); and possibly two of our own, in which the hypertrichosis

Endocrine abnormalities have frequently been postulated to account for the hypertrichosis with gingival hyperplasia, but there is no good evidence that they have existed.

OTHER ASSOCIATED ABNORMALITIES

There is hardly any abnormality other than hypertrichosis which has been found in association with the gingival enlargement more



Fig. 2.—Well-developed hair on forearm of an affected man of 36 years.

was mild. Tomes (1879) said that Julia Pastrana, the celebrated hairy woman, had marked enlargement of the gums, and this may have been a similar condition.

The hypertrichosis has varied in extent from something grotesque to a degree of hairiness which is greater than that common in persons of the same race and sex but only a little beyond normal limits (Fig. 2). The excessive hair may be present at birth, as in Byars and Sarnat's case, where there was curly black hair down the back of the neck at birth and by 1 year of age similar hair over the entire back and limbs. In childhood the hair may be fine and sometimes fair, but in the adult it becomes coarse and black. Sometimes the hypertrichosis is not recognized until after puberty. In its milder forms it is likely to be recognized in females more frequently than in males.

There seems to be no difference between the gums of affected persons with and without excessive hairiness, in age of onset of hyperplasia, development, distribution, appearance, or otherwise; so that as far as the gums are concerned these two groups can be considered together.

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Fig. 3.—Black wiry hair, large nose, ears, and lips, and thickened facial skin of an affected man of 36 years.

than a few times. Feeble-mindedness has been repeatedly stated to be a characteristic concomitant of the gingival hyperplasia and this has also been denied. Gross's case was not originally described as feeble-minded, though this was added later; Waterman's bear-woman was; and one of Heath's was "said to be"; but subsequent cases have not been. The strange tendency to suicide in Weski's family was not confined to those with the enlarged gums. Likewise, the association with epilepsy or other fits mentioned by Salter and Heath has proved most exceptional. The scaphocephaly in Thoma's patient can be compared with the ill-shaped head in Gross's, though the latter may well have been rachitic. Dechaume, Descrozaillies, Payen, and Génin (1955) report a prolonged coagulation time in

two unrelated patients. While Weski's patients were of small stature, this has not been generally observed, nor the pallor which he noticed. The large lips mentioned in several reports (Perkoff, 1929) may have been due to their displacement and lack of function, but this

dentition is erupting, usually between 7 and 9 years, and it may be concluded that in most of these the gums are not much affected before that time, though not necessarily normal (Fig. 6). Sometimes the enlargement is not noticed until adult life, as in 2 cases described



Fig. 4.—Gums of an affected boy of 2½ years.

may not be the whole explanation, for enlargement of the nose and ears (Raynal, 1909) with thickening of the facial skin has also been observed in several cases and has been compared with what is found in acromegaly (Fig. 3). There may also be a redundancy of the mucosa of the lips, and the scalp hair, though not excessive in quantity, may be coarse and wiry.

On the whole it seems likely that an alteration in the quality of the facial skin of the adult may be a second anomaly sometimes linked with the gingival hyperplasia.

AGE OF ONSET

Many authors have stated that gingival hyperplasia has been present from birth; others that the condition is not present at birth. Weski (1920) actually examined an affected individual at 2 weeks of age and found no abnormality, but this does not mean that none is present at birth in some cases. According to Raynal (1909), it was seen the day after birth in 3 children of one family. The point is not very important. It is known that the hypertrichosis may be present at birth and there is ample testimony that the gingival hyperplasia may be noticed during the eruption of the deciduous teeth and sometimes during the first weeks of life (Figs. 4, 5). In a large group of cases, however, the anomaly is not noticed until the second



Fig. 5.—Gums of an affected boy of 5 years, son of patient seen in Fig. 3.



Fig. 6.—Gums of an affected boy at 7 years: same patient as seen in Fig. 4.

by Dechaume and others (1955); but when there is already substantial enlargement of all the gums at that age one may suppose that many years of development lie behind the existing condition, since the rate of enlargement is characteristically gradual. Where only the molar regions are affected, however, the onset may be no earlier than adolescence.

CLINICAL APPEARANCE

The clinical appearances in those cases where all the gums are affected have been repeatedly described and need only be summarized. The gums are of normal colour and firm but enlarged. In children their surface is smooth or finely stippled, but later

it may acquire papillary projections (*Fig. 7*). Only the fibrous tissue of the gums is involved and the frenular attachments of mucosa tend to separate the enlarged gum into lobules. The pressure of the gums in the opposite jaw may flatten the opposing surfaces. The

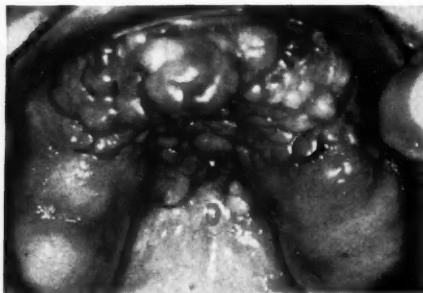


Fig. 7.—Nodular or papilliferous condition of gums and palate in a man of 36 years.



Fig. 8.—Gums of an affected boy of 10 years. There is a cyst of eruption over the left upper central incisor.

bilateral enlargement of the palate may be such that the swellings almost meet in the midline. The swellings anteriorly may prevent closure of the lips and protrude. In general, there has been greater enlargement in the upper than in the lower jaw, and more on the palatal than buccal side in the upper jaw with perhaps the opposite in the lower.

Failure or delay in the eruption of teeth is frequent and may occur in one or both dentitions. This is not altogether a failure of the teeth to move adequately in an occlusal direction, for it is often found that the teeth have in fact almost reached their normal position, but owing to the thickness of the gum may still remain covered by a thin layer

of it and invisible (*Figs. 8, 9*). Other teeth, of which only the occlusal surfaces are visible, may be in their fully erupted position. Teeth, of which the eruption has been delayed, may appear eventually in abnormal positions.

In the older patients the enlarged fibrous masses may become less firm in consistency and can sometimes be slid about over the underlying bone with surprising ease. In several cases it has been claimed that there was an excess of bone as well as fibrous tissue. Salter (1870) thought this, and more recently Engler and Leuin (1954) say that excess bone formation accompanied idiopathic hyperplasia in a brother and sister, a thickened alveolar process separating the deciduous and permanent teeth. This bone was said to be only faintly calcified. No sections or radiographs are shown. In other cases it is noticed that around unerupted teeth there is more bone present than would have been expected if the teeth had not been covered with excess of



Fig. 9.—The same boy as seen in *Fig. 8* a few weeks after gingivectomy around the upper incisors.

gum, which may indicate interference with the normal remodelling of the bony crypt of an erupting tooth.

PARTIAL CASES

In the cases so far considered, the hyperplasia affected the gums all round the jaws, nearly always both jaws, though commonly the upper more than the lower. In some cases the condition developed around a particular group of teeth, especially the incisors, before appearing elsewhere, and in one case (Colyer and Sprawson, 1953) on one side of both jaws, followed a year later by the other. Cernéa and others (1955) report a lady in whom only about three-quarters of both jaws was affected,

although other members of the family showed the full distribution.

There exists, however, a group of cases in which a very similar condition occurs only in the molar regions of one or both jaws, and

smooth mucosa, and of a characteristic shape. Starting opposite the first molar, it gradually increases in width posteriorly so that its long axis forms an angle with the alveolar process, the whole being somewhat pear-shaped. Its

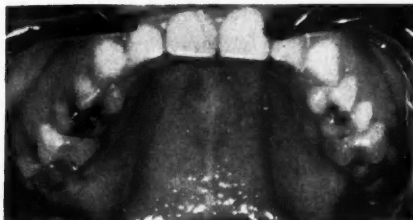


Fig. 10.—Woman of 27 years with so-called symmetrical fibroma of mild degree.

particularly on the palatal side of the upper molars and maxillary tuberosity. Such cases have been called symmetrical fibroma of the palate, but the palatal swellings can be accompanied by symmetrical swellings in the lower molar regions also.

The so-called "symmetrical fibroma" of the jaws appears to be a partial type of idiopathic fibrous hyperplasia, though a familial distribution has not been demonstrated. It has been infrequently studied. Hesse (1910) gave a short description of a very well-marked case and suggested that it was of the same sort as Hissey's (1893) case of idiopathic generalized gingival hyperplasia—in his view fibromata or osteofibromata. Hesse's patient, a man of 27 years, first noticed the swellings when a boy. They occupied the molar regions in both jaws, especially the palatal side of the upper jaw where they were only 1 cm. apart in the mid-line, soft peripherally, and the colour of normal gum. In the lower jaw they were smaller and extended more lingually than buccally. Williger (1910) illustrated a case in the same year, and Bauer (1916), in describing another in which only the upper jaw was affected, repeated the comparison with general idiopathic hyperplasia, although he thought chronic inflammation and carious teeth at fault. He refers to a similar case published by Kraus in 1909.

Clinical Appearance.—The palatal enlargement is firm and fibrous, covered by normal



Fig. 11.—Woman of 30 years with well-marked fibrous hyperplasia in the upper molar regions.

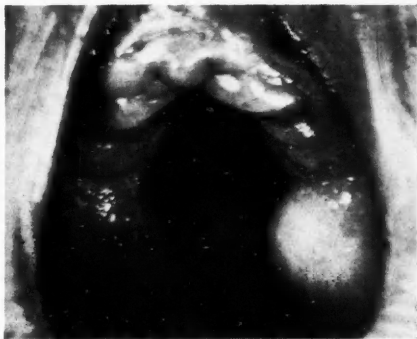


Fig. 12.—Man of 47 years. The hyperplastic swellings in the upper molar regions have become soft and jelly-like.

position in relation to the alveolus is comparable with that of the pseudo-alveolar wall to the alveolar wall in the fetus (Fig. 10). When well developed it may so protrude that there is an undercut space above it on each side (Fig. 11). After loss of the teeth it may lose its characteristic shape and become more globular and much softer in consistency: this may be correlated with degenerative changes in the fibrous tissue (Fig. 12). The enlargement, which has the colour and at first the consistency of normal gum, does not appear to start until late childhood and is often unnoticed

until adult life has been reached and occasionally until the teeth have been removed. The swellings do not appear to grow much, if at all, in adult life and do not then recur after removal.



Fig. 13.—Bilateral fibrous enlargements in all molar regions, but most marked in lower jaw lingually. The left lower jaw is shown.

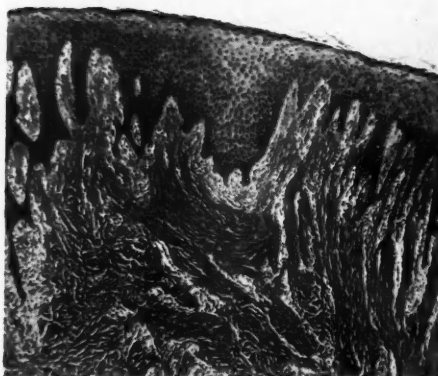


Fig. 14.—Section of affected gum from a boy of 10 years. Van Gieson. ($\times 44$.)

The symmetrical fibrous enlargements in the lower molar region are usually smaller than those in the upper and are flattened on their upper surface in contact with the upper jaw. They extend further lingually than buccally (Fig. 13).

In some cases the molar regions of one side only are enlarged, upper and lower; or both molar regions of either upper or lower jaw may be affected and not the other jaw.

HISTOLOGY

It is generally agreed that abnormal features are nearly confined to the connective tissue of

the gum. The epithelium often shows slight hyperplasia and has a tendency to be well keratinized. Hyperplasia of the fibrous tissue of the corium is the most striking feature (Fig. 14), with coarse and fine bundles of collagen fibres orientated in all directions. A relatively normal lamina propria is bound down by coarse fibrous bands to a dense pad of interlacing fibres. There is only slight evidence of infiltration with cells characteristic of inflammation and this is usually perivascular, except in the immediate vicinity of teeth or where the gum has been injured. Cernéa and others (1955) write that there is intense fibroblastic proliferation; this may be so at some stage, but in our material this has not been seen. A prominent feature is the mucoid degeneration which occurs within the fibrous

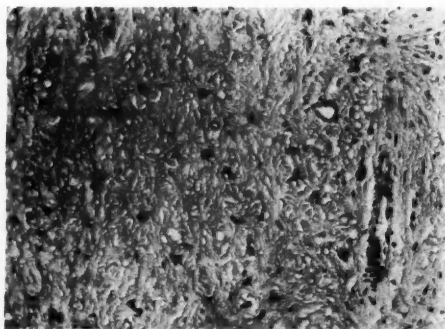


Fig. 15.—Section from fibrous enlargement of maxillary tuberosity in a woman of 30. There is advanced mucoid degeneration of the fibrous tissue and multinucleated cells are seen. Haematoxylin and eosin. ($\times 80$.)

masses and this has rarely been mentioned by authors. Ziskin and Zegarelli (1943) described mucinoid oedema in their case, a girl of 12 years, and this led them to think that their patient was myxoedematous and not an ordinary case of idiopathic hyperplasia of the gums. However, this change has been found in many of our specimens (Fig. 15). It occurs in the centre of the fibrous masses where the collagen fibres become separated and fragmented, and the interstices are filled with a material which stains pale blue with hæmatoxylin, reddish with thionin by Höjer's

method, and purple with aldehyde fuchsin, but does not give the periodic acid Schiff reaction or stain appreciably with mucicarmine.

It is presumably a degeneration product of the fibrous tissue. In the more advanced cases, multinucleated giant cells are found in the midst of this substance. These have not the appearance of foreign-body giant cells and may perhaps be derived from fibroblasts. This change no doubt accounts for the jelly-like consistency which parts of the gum sometimes have in older patients, enabling the fibrous masses to be slid about on the jaw. Indeed it is possible that the increase of size of the gums in older patients may be due to the accumulation of this amorphous material rather than continued fibroplasia. Foci of calcification were not seen in our cases but have been described. The general appearance did not suggest rapid growth. It did not differ in the partial and total cases.

DIAGNOSIS

The differential diagnosis between idiopathic hyperplasia and other forms of enlargement of the gums usually entails little difficulty. The common absence of hyperæmia and œdema excludes inflammatory hyperplasia, and the effects of pregnancy, acute leukæmias, and scurvy. Chronic leukæmia should be considered and is easily excluded by blood examination. Dilantin hyperplasia is excluded by careful inquiry as well as differences in the distribution of the overgrowth, which in that condition has the appearance of originating from the interdental papillæ. In neurofibromatosis other parts than the gums are likely to be affected also and the same is true of tuberous sclerosis. A solitary neurofibroma is likely to involve changes in the bone as well as being asymmetrical. In congenital facial hemihyperplasia there is enlargement of many other parts than the gums.

Some resemblance to idiopathic hyperplasia may be seen in children in whom the alveolar processes are enlarged by their content of teeth which have failed to erupt at the due time. Here, other signs of cleidocranial dysostosis may be found and the alveolar

enlargement can be recognized as bony rather than fibrous.

DISCUSSION

These fibrous hyperplasias are to be regarded rather as anomalies of development than as neoplasms. Their growth period is nearly always restricted to the growth period of the individual.

It has often been remarked that the overgrowth of gum appears to coincide chronologically with the eruption of teeth and it might be thought to be dependent upon that event in some way. It is clear, however, that the penetration of the gum by the teeth is not an indispensable condition, for it is well known that some teeth quite commonly fail to erupt into the mouth. It might be thought then that teeth during the intra-alveolar stage of eruption might provide the trigger mechanism for the hyperplasia. Some doubt is cast on this by one of our unilateral cases, a girl of 17 years, in whom the characteristic enlargement on the palatal side of one tuberosity and in the lower third molar region had recently been noticed. Radiographs showed that no third molars were present. It may be that the gum responds not to the intra-alveolar eruption of the tooth, but to influences which at certain stages of development normally promote the eruption of teeth and the correlated changes in gum and alveolar process. In some persons the period of eruption of the first deciduous teeth initiates the overgrowth, in others that of the first permanent teeth, and in others that of the later permanent teeth only.

The fact that the abnormal response can be partial and localized, and especially unilateral, suggests that the abnormality resides in the constitution of the affected part rather than in any humoral or endocrine abnormality of the individual, an exaggerated response of the target organ to the normal influences promoting growth and possibly other stimuli. When these influences are strong, as at the times of tooth eruption, the response is great; while the influences are still substantial, as during the growth period of the individual, the response continues, gradually subsiding as adult life is reached, but continuing in a

diminished degree in some individuals even in middle age. It is an interesting fact that the distribution of overgrowth of fibrous tissue in the mouth corresponds rather closely to that of areas overlying bone which normally lack a distinct submucous layer, where the mucosa

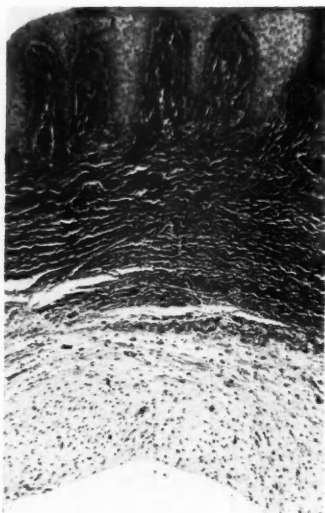


Fig. 16.—Section of affected gum overlying unerupted upper central incisor of a boy of 10 years. The fibrous tissue nearest the tooth (bottom) contains few collagen fibres. Van Gieson. ($\times 44$.)

is directly and firmly attached to the periosteum. These are areas which have a normal expectation of heavy mechanical stimulation. Since the anomaly can occur in very early infancy, mechanical stimulation cannot be the only precipitating cause, but the observation that regression will frequently follow the removal of teeth suggests that here the reduction of stimulation, whether mechanical or chemical, is of importance. It appears possible to envisage the abnormality as a localized propensity on a genetic basis to react by the excessive production of fibrous tissue to stimuli of many kinds.

It has already been said that when teeth fail to penetrate the gum the failure of eruption is not quite so complete as at first sight appears, since the overgrowth of gum masks the fact that teeth have in many cases

almost reached their normal occlusal position even though still covered. Nevertheless, they often fail to reach the normal position by a few millimetres and remain covered by gum, which though thick over the sides of the tooth is thin over the occlusal surface or incisal margin.

Thus, in a boy of 10 the thickness of gum over the incisal margin of the unerupted upper central incisors was less than 2 mm., and since this thin layer was being continually compressed between the food chewed and the incisal margin it is hard to see why the tooth did not penetrate it. It seems insufficient to suggest that the reason lies in either the thickness of the overlying gum or its density. As regards the thickness, a tooth normally passes through a greater thickness of soft tissue without difficulty; and as regards the density, it can be seen in sections that the part nearest the tooth is not densely fibrous at all, but oedematous and containing few collagen fibres (Fig. 16). It may be that collection of fluid around the crown of the tooth, which in some cases amounts to a cyst of eruption, exerts a cushioning effect, preventing penetration of the overlying mucosa; but it also seems possible that there may be in this condition some interference with the mechanism which normally permits dissolution of the collagen fibres in the path of an erupting tooth. If this be so, the fibrous masses may represent the result of a failure of resorption as well as an excessive apposition of collagen fibres and the accumulation of mucoid material may represent another aspect of such a failure.

TREATMENT

After recurrence had been noticed to follow removal of excess gum in children, the earlier views as to treatment were drastic. Thus Heath said that nothing less than complete removal of the affected alveolus seemed to offer any hope of alleviating these cases and his opinion has been reiterated up to recent times. Weski (1920), however, observed that in his cases removal of the teeth alone appeared to be effective, the gums then returning towards normal. In recent years repeated attempts at more conservative methods have

been made and sometimes with success. In this connexion it must be noted that the earlier cases reported were of outstanding severity, less severe ones being unrecognized, whereas now the majority recognized are of a moderate character. Long-term follow-up studies of cases treated conservatively are hardly available, but it is certainly true that some do not show continued growth in the treated area over several years even when no teeth have been removed; others do.

It is likely that the tendency to excessive growth is of different duration in different persons, but it is also probable that whether renewed growth follows operation depends on the age at which operation is performed. As the most active growth is in youth, and particularly in areas where teeth are developing and erupting, then the later operation takes place the more likely it is to have lasting success.

On the other hand, when teeth do not erupt through the thickened gum, a limited early operation to enable them to do so seems advisable, both for the sake of appearance and because otherwise their course may be diverted and they may subsequently erupt in the wrong places. Perhaps the right time to do this is about 1-2 years after the teeth concerned would normally have been expected to penetrate the gum.

Whereas in the past it has often been taught that recurrence is to be expected if any of the enlarged gum (regarded as neoplastic) be left *in situ* and drastic operations have been performed even by those who did not consider it necessary to remove the alveolar bone as well, it now seems likely that usually only a limited remodelling operation is required in the adult and older adolescent, in contrast to the large excisions, treated with the actual cautery to arrest hæmorrhage, which were at one time the rule. The same is true of "symmetrical fibroma" of the palate, which, being usually treated by conservative excision in the adult, has no reputation of a tendency to recur. Nevertheless, there will still be a few generalized cases which will continue to show slow enlargement in adult life after repeated operations which have included the removal

of all teeth. In one such case under observation after operations including the removal of all teeth performed at the ages of 16 and 26 years, a further operation has been necessary at 36.

Whether radiotherapy has a part to play in treatment is still an open question. Recorded attempts to treat the condition by radiation without surgery (Buchner, 1937) have not been successful, but limited radiation following conservative surgery, such as has been used by surgeons to prevent the formation of keloids, might have a place, though it might also be injurious to the attachments of the teeth.

The fact that the hyperplasia has often been said to cease and the enlargement to regress after removal of teeth suggests that sources of irritation associated with teeth may be factors in continued overgrowth and that effective oral hygiene may be important in its control.

CASE REPORTS

I. General, affecting all the gums of both jaws.—

Case 1.—B. L., man. Treated for hyperplasia of gums from 2 to 16 years at Hospital for Sick Children by Mr. A. T. Pitts. Portions of gum, and teeth of both dentitions removed. Full dentures provided at 16 years. Further operation and new dentures at 26 years. Further operation at 35 years (Mr. Patrick Clarkson). Skin of face thickened and coarse; large nose and ears. Black, wiry scalp hair, and more than average hairiness of limbs.

Son also affected, otherwise negative family history. (Figs. 2, 3, 7.)

Case 2.—B. L., son of above. Gums thought peculiar soon after birth and grew up with the teeth as they erupted. At 5 years only tips of teeth showed (Fig. 5); gums were large, firm, pale pink, and stippled, flattened where in contact. Anterior gingivectomy at 6 years was followed by eruption of the permanent incisors. Further gingivectomy necessary at 9 and again at 12 years. (Operations by Sir Wm. Kelsey Fry and Mr. R. D. Emslie.)

Case 3.—J. E., boy. Enlarged gums noticed at 8 years, when one permanent molar was the only permanent tooth erupted in the upper jaw. There was a cyst of eruption around the crown of *I*₁. The lower gum covered three-quarters of the crowns of the lower incisors. Anterior gingivectomy in the upper jaw (Mr. K. Pringle) was followed by complete eruption of incisors without recurrence 4 years later. Large flat pads of gum still covered the unerupted second molars. Supernumerary premolars present in the upper jaw. Sister affected, but no other members of family. (Figs. 8, 9, 14, 16.)

Case 4.—P. E., sister of above. Enlarged gums noticed at 9 years, less severe in lower jaw anteriorly.

Case 5.—A. W., boy. Enlarged gums noticed at 2 years, when only first incisors visible in upper jaw and anterior teeth partly visible in lower. No other members of family thought to be affected.

More than average growth of fine hair on face and limbs. Still progressing at 7 years. (Figs. 4, 6.)

Case 6.—G. S., girl. Enlarged gums noticed in childhood. At 20 years partial eruption and malposition of many teeth. Removal of all upper teeth and alveolectomy was not followed by recurrence 7 years later. The condition of the less enlarged lower gums had not altered. No other members of family affected.

2. Partial.—

(a) Molar Region, Bilateral.—

Case 7.—Y. S-P., woman. At 17 years posterior part of gums of both jaws on both sides grew large and remained the same 10 years later. Greatest enlargement on palatal side of upper molars, firm, symmetrical, and of normal colour. Pads of gum in lower third molar regions. Negative family history. (Fig. 10.)

Case 8.—F. W., man. Bilateral fibrous enlargement of the maxillary tuberosities noticed at 39 years when all teeth were removed and an artificial denture was made. When seen at 47 years the tissues had become inflamed by the denture: the swellings were thought to be smaller and were very soft. The lower jaw appeared normal. A sister is said to have a similar condition. (Fig. 12.)

Case 9.—J. W., woman. Bilateral fibrous enlargement on palatal side of upper molar regions noticed at 30 years. Lower jaw normal. Negative family history. (Operation by Mr. D. M. Macdonald.) (Fig. 11.)

Case 10.—M. R., boy. Bilateral enlargement of gums in lower molar region, especially on lingual side, first noticed a year previously at 13 years. Upper jaw normal. Negative family history.

Case 11.—M. H., girl. Bilateral enlargement on palatal side of upper molars, but very slight on left. Swelling thought to be increasing on right at 17 years. Negative family history. (Operation by Mr. S. H. Wass.)

Case 12.—M. T., woman. Bilateral enlargement on palatal side of upper molars but much more on the right than on left. First noticed at 17 years, when there was an abscess on the upper right first molar. Now, at 30 years no recent growth. No swellings of lower gums. $\overline{8}\overline{5}$ are abnormally large teeth of unusual shape. Negative family history.

Case 13.—D. R., girl. Bilateral enlargement in upper and lower third molar regions first noticed at 18 years. Most marked in lower, lingually. (Operation by Mr. E. G. Searle at 20 years.) Negative family history. (Fig. 13.)

(b) Molar Region, Unilateral.—

Case 14.—P. L., girl. Enlarged gums on right side noticed at $10\frac{1}{2}$ years. At 12 years gums in upper and lower premolar and molar regions twice as wide on the right, and crowns of teeth partly covered. No other members of family thought affected.

Case 15.—M. H., girl. Swelling in palate on left noticed at 16 years. At 17 years substantial, firm, fibrous enlargement of palatal gum in $\overline{6}\overline{7}$ region, none

buccally. Similar mass in $\overline{8}$ region, but all third molars absent radiographically. Negative family history. (Operation by Mr. R. A. J. Mayhew.)

In conclusion I would like to express my thanks to colleagues who have allowed me to study their cases; to Miss Whiteley of the Dental Photographic Department, Guy's Hospital; and to Mr. J. E. Hutchinson, who has made the histological preparations and photomicrographs.

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PROVISION FOR OLD AGE

By JOHN LYMESTER

A MATTER of great importance to many dental practitioners is provision for their retirement or old age. Certain practitioners are in public service and have pensionable employments, and consequently the question of their old age is largely taken care of.

Others who are in private practice must consider the problem because there is a period when, of course, they may be unable to continue their practice. Others are in the position that they have partially pensionable employment and partially private practice.

The Finance Act, 1956, has made certain very important provisions to enable taxpayers to make provision for their old age by the purchase of retirement annuities, and, subject to certain limits, these premiums are allowable for both income-tax and surtax purposes.

The relief is generally limited to one-tenth of their earned income with a maximum of £750, although in the case of persons of more mature age, one of the Schedules increases these limits.

The Act now provides that if a person is partly in pensionable employment and partly in private practice his relevant income for the purposes of these provisions is that part of his earned income which is received from non-pensionable employment.

There are several methods of providing relief for old age.

The first is obviously the retirement annuity now provided by the Finance Act. Alternatively, however, a person could take out an endowment insurance providing for himself, at the age upon which he thinks he must retire, a lump sum. With this lump sum he can, if he so desires, now purchase a life annuity and that portion of the life annuity which is the repayment of the capital portion is exempt from income tax. Also with an endowment policy the money received can be invested in securities and the practitioner can live on the dividends.

In my opinion, every practitioner who thinks of making provision for his retirement or old

age should carefully consider, as early as possible in his career, provision for his old age. If his employment is pensionable the question is settled, provided always, of course, the pension is, in his opinion, adequate for his future. If he is partly in employment and partly in practice, then he must consider the problem on a *pro rata* basis as if he was entirely in public practice.

The practitioner in public practice has the alternatives offered to him, that he may contribute under a scheme provided by a trust or by an assurance company for his old age. The premiums, subject to the limits, are allowable for his tax purposes. He has, however, no right to charge the money which he has accumulated for the retirement annuity, and therefore, whilst in public practice, he has no call on large sums which he has invested.

Alternatively, if he takes out an endowment policy, he has a security which in bad times he can always charge for an advance on his bank, etc., or upon which the assurance company would grant him a loan.

This may be in many cases not a good point, in that the provision for old age can be jeopardized in any period of difficulty. He has also to consider the various policies of the assurance companies whereby a person can pay into the assurance company payments for a pension at a certain age, these being not in the same nature as retirement pensions.

The pension schemes and the payments of the premiums have to comply with certain conditions imposed by the Finance Act, 1956, but obviously those companies which issue policies will make certain that conditions are complied with.

In my opinion, every dental practitioner should consider his position and obtain quotations from the assurance companies both for retirement annuities and for endowment policies, and should consider from his own circumstances and his own future that which will be of advantage to him. The younger practitioner should not involve himself in too much annual expenditure. He can start with a smaller sum and gradually increase. There is no sense in undertaking commitments which may spoil his future.

LETTER TO THE EDITOR

Dec. 1, 1956.

Dear Sir,

I have read with great interest the paper by Dr. Munro on Thumb- and Finger-sucking and the discussion which followed, but I was surprised that there was no reference to digit sucking as a problem in maturation.

As the result of the experience gained from the study and treatment of a very considerable number of cases, we in the West Riding are of the opinion that digit sucking in by far the majority of cases is not an acquired and pernicious habit but is the persistence of an infantile pattern of behaviour which was functionally normal at one time in the child's life, but which for some reason, perhaps one of the reasons suggested as a cause of the habit in Dr. Munro's paper, has not been discarded at the appropriate time in the process of maturation.

Sucking is probably the most important volitional motor activity of the new born infant whose survival depends on its ability to suck and it must therefore be regarded as a basic pattern of behaviour. During the early months of life the child obtains its greatest satisfaction by means of the oral area. As its movements become more co-ordinated everything within reach, blanket, clothing, foot, fist, thumb or finger is carried to its mouth, but gradually with the development of the nervous and muscular systems the child is able to obtain pleasure and satisfaction in a progressively increasing variety of activities, and interest is diverted from the mouth. In some cases, however, the early behaviour

pattern may not be outgrown completely and some aspect of it may persist beyond the time when it should normally have been discarded.

Digit sucking would seem to fall into this category. It may occur as an isolated factor but it is not infrequently found to be associated with problems in general behaviour, deglutition, and toilet training. It is surprising how many children who suck their thumb or fingers are also enuretics. This information is often difficult to elicit from the parent and so often goes unnoticed.

Cessation of the sucking habit is almost invariably followed by beneficial results on the whole personality of the child and in the case of the enuretic there is also a cessation of the bed-wetting habit. These improvements in behaviour and personality may be coincidental but from the fact that they occur so frequently in digit suckers whose treatment comes within the sphere of the orthodontist, it would seem that with the breaking of the sucking habit the child has succeeded in overcoming the obstacle which had prevented him from attaining the behaviour patterns appropriate to his age.

I would suggest that this aspect of the problem of digit sucking is worth pursuing.

Yours sincerely,

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ABSTRACTS FROM OTHER JOURNALS

A Study of Enamel Abrasion as Related to Partial Denture Clasps

The purpose of this study was to obtain some evidence as to whether clasp arms of base metal or of gold damaged the enamel of the teeth on which they operate. A machine was devised which simulated the movements of the clasp in insertion and withdrawal. Natural teeth were employed, some dry, some immersed in saliva. The severity of the test was increased by increasing both the depth of the undercut and the penetration on the clasps into the undercut, and further, by distorting the clasps so that the bearing pressure was increased. Each specimen was subjected to the cycle of insertion and withdrawal 25,000 times. In another series the vibratory movements arising from mastication were simulated. Degree of abrasion was determined by comparison of silhouette before and after test. Despite the severity of the test conditions, no loss of substance could be detected. It is

emphasized that the study related to physical abrasion only.—PHILLIPS, R. W., and LEONARD, L. J. (1956), *J. pros. Dent.*, 6, 657.

Desensitizer for Dentine and Painful Gingival Sockets

A saturated solution of aluminum chloride is a very effective means of desensitizing dentine. Necks of teeth and cavities remote from the pulp may be desensitized by dampening a small pledget of cotton-wool in the solution and rubbing over the area until sensitiveness disappears. There may be an initial sharp pain which is transient. The solution is harmless to the gum, and may be applied to check gingival pockets.

To make the solution: Pour "Sentesin" (contains Benzocaine) or carbital, in which aluminum chloride will dissolve, in $\frac{1}{2}$ oz. bottle and add the aluminum chloride to saturation.—HUSBAND, F. C. (1956), *J. Canad. dent. Ass.*, 22, 473.